

Abstract:

A portable device for applying therapeutic electrical signals and/or electromagnetic fields to a patient's knee for the treatment of osteoarthritis and other diseases, defects and injuries. The device is operable in several modes to deliver signals to the patients knee so as to cause an electric and/or electromagnetic field to be generated that selectively up-regulates gene expression of Aggrecan and Type II Collagen while simultaneously selectively down-regulating the gene expression of metalloproteases. The device includes a signal generator that generates compound electric signals including a 60kHz sine wave having a peak to peak voltage of approximately 4.6 V to 7.6 V and a 100% duty cycle signal that is generated for approximately 30 minutes and a 50% duty cycle signal that is generated for approximately 1 hour after the 100% duty cycle signal. These compound electric signals are communicated to electrodes or coils in the proximity of a patient's knee for the generation of a specific and selective electromagnetic field that treats the diseased tissue.